

2001 HIGHER SCHOOL CERTIFICATE EXAMINATION

Biology

Section I – Part B (continued)

Marks

Question 22 (6 marks)

- (a) Cloning is a technique that could be used to increase numbers in an endangered species. What effect would cloning have on the genetic diversity of the species? 2

cloning would produce identical copies of the species and with few numbers remaining on earth, reproduction between similar organisms would produce similar offspring and hence reduce the genetic diversity of the species.

- (b) Explain TWO possible evolutionary effects of a disease entering an endangered population containing some cloned individuals. 4

If the cloned individuals are not naturally resistant to the disease, all of these individuals would die. Without ^{large} genetic diversity, if one organism is effected many more would also be effected ~~and~~ and only few would survive. This could have a severely detrimental effect on an endangered species because numbers would be decreased even further.

On the contrary to this, cloned individuals with natural resistance would survive and produce offspring also with the resistance to the disease. This could lead to an increase in the species number because it would become virulent to the disease.

Marks

Question 23 (3 marks)

In twelfth-century China, people seeking protection from smallpox removed scabs from people mildly scarred from the disease. These scabs were then ground and inhaled as powder. Similarly, in the seventeenth century, an Englishwoman, Mary Montagu, injected bits of smallpox scabs into healthy children to protect them from the disease.

3

In the light of our current knowledge about the immune response, explain why these practices were successful.

These practices were successful because the smallpox scabs were ~~a~~ weakened antigens of the disease, and from knowledge of the immune response if weakened or dead diseases are given to someone, it initiates the immune response to produce antibodies against the disease, and ~~a~~ also to produce memory cells to recognise and destroy the disease if it is caught.

Question 24 (4 marks)

Explain the relationship between the cause and ONE symptom of ONE named non-infectious disease.

4

a non-infectious disease could be an Environmental ^{disease}.
Chronic lead poisoning symptom is tasting lead in the mouth, anaemia and headaches.
The cause is prolonged exposure to an environment with high toxic levels of lead. Over exposure leads to high levels of Pb in the blood causing respiratory problems and chest pain.